

IN THE CLAIMS:

This listing of claims will replace all prior versions, and listings, of claims in the application:

1. (Currently Amended) A card processing system using an IC card having an electrical contact and an IC card antenna, the IC card capable of exchanging information through the electrical contact with an on-board unit installed in a vehicle using a toll road, and capable of wireless communication with an antenna unit installed at a roadside of the toll road through the IC card antenna, the card processing system comprising:

a first processor configured to execute at an entrance of the toll road an electronic toll collection process through the wireless communication between the antenna unit installed at the roadside and the on-board unit into which the IC card is inserted to electrically connect the electrical contact of the IC card with the on-board unit;

a second processor configured to execute at the entrance of the toll road a non-contact IC card process through the wireless communication between the antenna unit installed at the roadside and the IC card through the IC card antenna when an error is generated in the electronic toll collection process by the first processor;

comparison/collation means for comparing and collating the peculiar information that are stored in the on-board unit and the IC card, respectively, when the IC card storing entrance information of the toll road ~~by the second processor~~ is inserted in the on-board unit subsequent to the non-contact IC card process executed by the second process; and

means for storing the entrance information stored in the IC card as a result of the non-contact IC card process executed by the second processor in the on-board unit when peculiar information stored in the on-board unit and the IC card unit are matched to each other by the comparison/collation means.

2. (Cancelled).

3. (Currently Amended) A card processing system using an IC card having an electrical contact and an IC card antenna, the IC card capable of exchanging information through the electrical contact with an on-board unit installed in a vehicle using a toll road,

and capable of wireless communication with an antenna unit installed at a roadside of the toll road through the IC card antenna, the card processing system comprising:

a first processor configured to execute at an exit of the toll road, an electronic toll collection process through the wireless communication between the antenna unit installed at the roadside and the on-board unit into which the IC card is inserted to electrically connect the electrical contact of the IC card with the on-board unit; and

a second processor configured to execute at the exit of the toll road a non-contact IC card process through the wireless communication between the antenna unit installed at the roadside and the IC card through the IC card antenna when an error is generated in the electronic toll collection process by the first processor, and

comparison/collation means for comparing and collating the peculiar information of the on-board unit stored in the on-board unit and the IC card, respectively when the IC card is inserted into the on-board unit subsequent to the non-contact IC card process executed by the second process.

4. (Cancelled).

5. (Currently Amended) The card processing system according to claim 1, further comprising:

a comparison/collation means for comparing and collating the on-board unit peculiar information and entrance information that should have been stored in the ~~onboard~~ on-board unit and the IC card, respectively when the IC card storing the entrance information obtained by the on-board unit in the entrance processing at the entrance by the first processor is pulled out of the on-board unit and inserted into the on-board unit again; and

means for storing a possibility of illegality in at least either one of the IC card and the on-board unit when at least either one of the on-board unit peculiar information and the entrance information is detected as being mismatch.

6. (Previously Presented) The card processing system according to claim 3, wherein the second processor includes judging means for judging the exit process is possible by collating the information obtained from the IC card through the wireless communication with the IC card and the information obtained from the on-board unit before the exit process that is executed by the first processor is abnormally finished, and an exit processor to execute

the exit process by determining a vehicle class from the information obtained from the IC card, further comprising:

means for storing information of the result of the exit process by the exit processor and the abnormally finished history information in the exit process by the first processor.

7. (Previously Presented) The card processing system according to claim 1, further comprising:

notifying means for notifying that the IC card is not inserted in the on-board unit to a user of the IC card when peculiar information of the on-board unit was obtained by the first processor that is executed at the entrance of the toll road but the individual information of the IC card was not obtained;

comparison/collation means for comparing and collating the peculiar information of the on-board unit stored in the on-board unit and the IC card when the IC card is inserted into the on-board unit; and

warning means for warning the possibility of illegality for use of IC cards or on-board units.

8. (Currently Amended) The card processing system according to claim 3, further comprising:

notifying means for notifying a user of the IC card that the IC card was not inserted in the on-board unit when peculiar information of the on-board unit was obtained by the first processor that is executed at the exit of the toll road but the peculiar information of the IC card could not be obtained;

~~comparison/collation means for comparing and collating the peculiar information of the on-board unit stored in the on-board unit and the IC card, respectively when the IC card is inserted into the on-board unit; and~~

warning means for warning a possibility of illegality for use of IC cards or onboard units when the on-board unit peculiar information are detected as being mismatched as a result of the comparison by the comparison/collation means.

9. (Currently Amended) The card processing system according to claim 1, wherein the second processor is executed through the wireless communication with the IC card pulled out of the on-board unit and further comprising:

detecting means for detecting that the IC card is inserted into the on-board unit; means for storing peculiar information of the on-board unit stored in the onboard unit in the IC card and individual card information stored in the IC card in the on-board unit when the detecting means detects that the IC card is inserted in the onboard unit;

~~comparison/collation means for comparing and collating the peculiar information of the on-board unit stored in the IC card and the peculiar information of the on-board unit stored in the on-board unit when the IC card is inserted in the onboard unit again after the second processor is executed with the IC card pulled out of the on-board unit;~~ and warning means for warning possibility of illegality when the peculiar information of both the on-board units are detected as being mismatched as a result of the collation by the comparison/collation means.

10. (Previously Presented) The card processing system according to claim 1, further comprising:

detecting means for detecting a contact defect by the communication through the electrical contact provided in the IC card;

reading means for reading out the information stored in the IC card through an antenna provided in the IC card by the second processor when the contact defect is detected by the detecting means;

means for sending the IC card information read by the reading means to an upper rank host computer for enquiry; and

means for writing the IC card information in a separate new IC card and reissuing this IC card when the match is answered by the upper rank host computer in response to the enquiry made for the IC card.

11. (Currently Amended) A card processing method using an IC card having an electrical contact and an IC card antenna, the IC card capable of exchanging information through the electrical contact with an on-board unit installed in a vehicle using a toll road, and capable of wireless communication with an antenna unit installed at a roadside of the toll road through the IC card antenna, the method comprising:

first executing at an entrance of the toll road an electronic toll collection process through the wireless communication between the antenna unit installed at the roadside and the onboard unit into which the IC card is inserted to electrically connect the electrical contact of the IC card with the on-board unit;

second executing at the entrance of the toll road a non-contact IC card process through the wireless communication between the antenna unit installed at the roadside and the IC card through the IC card antenna when an error is generated during the electronic toll collection process in the first executing;

subsequent to the non-contact IC card process executed by the second process, comparing and collating peculiar information stored in the on-board unit and the IC card, respectively, when the IC card storing entrance information of the toll road is inserted into the on-board unit ~~in the second executing step~~; and

storing the entrance information stored in the IC card as a result of the non-contact IC card process executed by the second processor in the on-board unit when the on-board unit peculiar information are matched to each other in the comparing and collating step.

12. (Cancelled).

13. (Currently Amended) A card processing method using an IC card having an electrical contact and an IC card antenna, the IC card capable of exchanging information through the electrical contact with an on-board unit installed in a vehicle using a toll road, and through a capable wireless communication with an antenna unit installed at a roadside of the toll road through the IC card antenna, the method comprising:

first executing at an exit of the toll road, an electronic toll collection process through the wireless communication between the antenna unit installed at the roadside and the on-board unit into which the IC card is inserted to electrically connect the electrical contact of the IC card with the on-board unit; ~~and~~

second executing at the exit of the toll road a non-contact IC card process through the wireless communication between the antenna unit installed at the roadside and the IC card through the IC card antenna when an error is generated during the electronic toll collection process in the first executing, and

subsequent to the non-contact IC card process executed by the second process,  
comparing and collating peculiar information of the on-board unit stored in the on-board unit and the IC card, respectively when the IC card is inserted into the on-board unit.

14. (Cancelled).

15. (Previously Presented) The card processing method according to claim 11, further comprising:

comparing and collating on-board unit peculiar information and entrance information that should be stored in the on-board unit and the IC card, respectively, when the IC card storing the entrance information obtained by the on-board unit in an entrance process of the first executing step performed at the entrance is pulled out of and inserted again into the on-board unit again; and

storing a possibility of illegality in at least one of the IC card and the on-board unit when at least either one of the on-board unit peculiar information and the entrance information is mismatched in the comparing and collating step.

16. (Previously Presented) The card processing method according to claim 13, wherein the second executing step includes judging whether the exit process can be executable by collating the information obtained from the IC card through the wireless communication with the second executing and the information obtained from the on-board unit before the exit process executed in the first executing step is abnormally finished and the exit processing step to execute the exit process by determining a vehicle class from the information obtained from the IC card when the exit process is judged executable in the judging step, further comprising:

storing the information of the exit processing result in the exit processing step and the history information of the abnormally finished exit process in the first executing step in the IC card.

17. (Previously Presented) The card processing method according to claim 11, further comprising:

informing a user of the IC card that the IC card was not inserted into the onboard unit when peculiar information of the on-board unit was obtained but individual information of the IC card could not be obtained in the first executing step performed at the entrance of the toll road;

comparing and collating on-board unit peculiar information stored in the onboard unit and the IC card, respectively when the IC card is inserted into the on-board unit; and

warning a possibility of illegality for use of the IC card or on-board unit when the peculiar information of the on-board units are detected as being mismatched as a result of the collation in the comparing and collating step.

18. (Previously Presented) The card processing method according to claim 13, further comprising:

informing a user of the IC card that no card is inserted into the on-board unit when peculiar information of the on-board unit was obtained but individual information of the IC card could not be obtained in the first executing step performed at the exit of the toll road;

comparing and collating the on-board unit peculiar information stored in the on-board unit and the IC card, respectively when the IC card is inserted-into the onboard unit; and

warning a possibility of illegality of use of the IC card or on-board unit when peculiar information of the on-board units are detected as being mismatched as a result of the collation in the comparing and collating step.

19. (Currently Amended) The card processing method according to claim 11, wherein the second executing step is performed through the wireless communication with the IC card pulled out of the on-board unit, further comprising:

detecting that the IC card is inserted into the on-board unit;

storing on-board unit peculiar information stored in the on-board unit in the IC card and storing individual card information stored in the IC card in the on-board unit;

~~comparing and collating the on-board unit peculiar information stored in the IC card with the on-board unit peculiar information stored in the on-board unit when the IC card pulled out of the on-board unit is inserted into the on-board unit again after the second executing step is performed with the IC card; and~~

warning a possibility of illegality when the peculiar information of the onboard units are detected as being mismatched as a result of the collation in the comparing and collating step.

20. (Previously Presented) The card processing method according to claim 11, further comprising:

detecting a defective contact through the communication with the electric contact provided in the IC card;

reading out information stored in the IC card through an antenna provided in the IC card according to the second executing step when the defect of the contact is detected by the detecting step;

requesting an enquiry by sending the IC card information read in the reading step to an upper rank host computer; and

writing the IC card information in a separate new IC card and reissuing this IC card when the match is answered by the upper rank host computer in response to the enquiry made for the IC card in the requesting step.

21. (New) The card processing system according to claim 1, further comprising a device configured to inform a user of the IC card when the error is generated in the electronic toll collection process by the first processor.

22. (New) The card processing system according to claim 21, wherein the device is a display.